

## 1 CLAIMS

2

3 1. A turnout for a railway track comprising a pair  
4 of spaced apart rails, the turnout comprising a  
5 raised track surface which is adapted to provide a  
6 path along which the wheels of a train can travel  
7 from one railway track to another, wherein the  
8 raised track surface comprises first and second  
9 portions and is arranged such that the wheels of the  
10 train are first raised by the first portion to a  
11 first rail crossing height and then lowered by the  
12 second portion to a height at a location between the  
13 pair of spaced apart rails of the railway track.

14

15 2. A turnout according to claim 1, wherein the  
16 raised track surface is adapted such that the wheels  
17 of the train are first raised to a rail crossing  
18 height in order for a first wheel to cross a first  
19 rail, then lowered to a height at a location between  
20 the pair of spaced apart rails, then raised to the  
21 rail crossing height in order for a second wheel to  
22 cross the first rail, then preferably lowered to a  
23 height at a location between the first and second  
24 railway tracks.

25

26 3. A turnout according to either of claims 1 or 2,  
27 wherein a pair of turnouts may be combined in order  
28 to form a crossover adapted to allow a train to be  
29 transferred from the first railway track to the  
30 second.

31

1     4.    A turnout according to any preceding claim,  
2     wherein a pair of crossovers may be used in  
3     conjunction in order to allow a train to be  
4     transferred from the first railway track to the  
5     second railway track and back again to the first  
6     railway track.

7  
8     5.    A turnout according to any preceding claim,  
9     wherein the raised track surface is substantially  
10    non-intrusive and the raised track surface is  
11    provided with a supporting means to allow for  
12    passage of trains.

13  
14    6.    A turnout according to any preceding claim,  
15    wherein each first and second non-intrusive  
16    crossovers comprise a pair of turnouts, and  
17    preferably each pair of turnouts comprise a pair of  
18    rails which form the raised track surface.

19  
20    7.    A turnout according to any preceding claim,  
21    wherein each rail of the turnout further comprises  
22    at least a ramp surface.

23  
24    8.    A turnout according to claim 7, wherein each  
25    ramp surface is tapered from a short or no height  
26    end to a relatively tall height end.

27  
28    9.    A turnout according to either of claims 7 or 8,  
29    wherein each ramp surface comprises a linear taper  
30    from the short or no height end to the relatively  
31    tall height end which is of the same height as that  
32    of the first rail crossing height.

1

2 10. A turnout according to any of claim 7 to 9,  
3 wherein the relatively tall height end of the ramp  
4 surface is adjacent to an end of the raised track  
5 surface at its first rail crossing height, the two  
6 combining to provide a path along which the wheel is  
7 permitted to travel whilst maintaining a  
8 substantially equal distance between a pair of  
9 raised rails, which combined, form the raised track  
10 surface.

11

12 11. A turnout according to any of claims 7 to 10,  
13 wherein the ramp surface comprises a ramp for each  
14 rail of the railway track, such that both ramps  
15 incline substantially simultaneously, thereby  
16 minimising differential levels in relation to the  
17 respective rails.

18

19 12. A turnout according to any preceding claim,  
20 wherein at least a crossing portion of each rail of  
21 the raised track surface comprises a slot formed  
22 therein below a rail head portion, wherein the slot  
23 is arranged to lie over or around the rail being  
24 crossed and the rail head portion is releasably  
25 fixed to the said rail being crossed.

26

27 13. A turnout according to any preceding claim,  
28 wherein at least a crossing portion of each rail of  
29 the raised track surface comprises a railhead  
30 portion arranged to lie over or around a supporting  
31 member which in turn is arranged to lie over or  
32 around the rail being crossed.

1

2 14. A turnout according to claim 13, wherein the  
3 supporting member is arranged with its longitudinal  
4 axis being parallel to the rails of the parent rail.

5

6 15. A turnout according to either of claims 13 or  
7 14, wherein the supporting member comprises at least  
8 an upper supporting member and at least a lower  
9 supporting member.

10

11 16. A turnout according to claim 15, wherein the  
12 upper supporting member is planar and has an upper  
13 surface attached to a lower surface of the crossing  
14 portion of the raised track.

15

16 17. A turnout according to either of claims 15 or  
17 16, wherein at least a portion of the raised track  
18 surface is supported by the parent rail and a fixing  
19 means.

20

21 18. A turnout according to any of claims 15 to 17,  
22 wherein the upper supporting planar member is  
23 substantially wider than an existing rail of one of  
24 the first and second railway tracks.

25

26 19. A turnout according to any of claims 15 to 18,  
27 wherein the upper supporting planar member comprises  
28 a rectangular plate.

29

30 20. A turnout according to any of claims 15 to 19,  
31 wherein a pair of guide means are provided along at

1     least a portion of the upper supporting member's  
2     length.

3

4     21. A turnout according to claim 20, wherein the  
5     guide means run parallel to the upper supporting  
6     member's longitudinal axis and project downwardly in  
7     order, in use, to straddle an existing rail of the  
8     first and second existing railway tracks.

9

10    22. A turnout according to any of claims 15 to 21,  
11    wherein a pair of lower supporting members are  
12    provided at either side of at least a portion of the  
13    existing rail.

14

15    23. A turnout according to claim 22, wherein the  
16    pair of lower supporting members combine to provide  
17    a substantially similar shape, width and position  
18    along the existing railway track as the upper  
19    supporting member, and are adapted to be releasably  
20    engaged thereto and releasably fixed thereto,  
21    wherein the lower surface of the upper supporting  
22    planar member lies on top of the uppermost surface  
23    of the lower supporting members.

24

25    24. A turnout according to claim 23, wherein the  
26    upper supporting member is moveably coupled to at  
27    least one of the lower supporting members by a hinge  
28    means.

29

30    25. A turnout according to claim 24, wherein the  
31    upper supporting member may be moved from the first  
32    to the second configuration by rotating the upper

1 supporting member about the hinge means relative to  
2 the lower supporting member.

3

4 26. A turnout for a railway track comprising a pair  
5 of spaced apart rails, the turnout comprising a  
6 raised track surface which is adapted to provide a  
7 path along which the wheels of a train can travel  
8 from one railway track to another, wherein the  
9 raised track surface comprises a crossing rail  
10 portion adapted to cross over one of the spaced  
11 apart rails, the crossing rail portion being coupled  
12 to an upper supporting member which, in use, rests  
13 upon and is supported by at least one lower  
14 supporting member, characterised in that the upper  
15 and at least one lower supporting members are  
16 coupled to one another by a moveable mechanism.

17

18 27. A turnout according to claim 26, wherein there  
19 a pair of lower supporting members are provided  
20 which combine to provide a substantially similar  
21 shape, width and position along the existing railway  
22 track as the upper supporting member and the upper  
23 supporting member comprises a substantially planar  
24 member and the lower surface of the upper supporting  
25 planar member lies on top of the uppermost surface  
26 of the lower supporting members.

27

28 28. A turnout according to either of claims 26 or  
29 27, wherein the moveable mechanism comprises a hinge  
30 mechanism arranged to permit the upper supporting  
31 member to move between a first configuration in  
32 which the upper supporting member is arranged in a

1 substantially horizontal plane and rests upon the  
2 pair of lower supporting members over the existing  
3 rail of the railway track and a second configuration  
4 in which the upper supporting member is remote from  
5 the existing rail such that a train wheel may be  
6 driven along the existing rail in normal running.

7  
8 29. A turnout according to any of claims 26 to 29,  
9 wherein the upper supporting member is moved from  
10 the first to the second configuration by rotating  
11 the upper supporting member about the hinge means  
12 relative to the lower supporting member.

13  
14 30. A turnout according to any of claims 26 to 30,  
15 wherein normal running of a train along the first  
16 and/or second existing railway track(s) is  
17 selectively allowed, where the train does not travel  
18 between the first and second existing railway tracks  
19 by moving or removing one or more sections of the  
20 crossover from engagement with the first and/or  
21 second existing railway tracks.

22  
23 31. A turnout according to claim 30, wherein the  
24 one or more moveable or removable sections comprise  
25 at least a ramp, a first raised portion of the  
26 raised track surface, at least an upper supporting  
27 member, and leaving in place the second lower  
28 portion of the raised track surface, and selectively  
29 includes at least one of the lower supporting  
30 members left in place.

31

1     32. A turnout according to any preceding claim,  
2     wherein the raised track surface comprises a  
3     plurality of rail members, one or more of which  
4     comprise a curved radius away from one of the  
5     railway tracks towards the other railway track.

6  
7     33. A turnout according to claim 32, wherein the  
8     plurality of rail members combine to form a turnout  
9     having a substantially continuous rail surface and  
10    includes the following components:-

11         the said first portion which includes a ramp  
12         member adapted to raise the train wheel to the rail  
13         crossing height;

14         a curved radius rail adapted to urge the train  
15         away from one of the railway tracks towards the  
16         other railway track;

17         the second portion which includes a further  
18         ramp member adapted to lower the train wheel to a  
19         lower height at a location in between the pair of  
20         spaced apart rails of the railway track;  
21         another first portion which includes a further ramp  
22         member to raise the train wheel from the lower  
23         height to a rail crossing height; and

24         a crossover rail adapted to allow the train to  
25         pass over an inner rail of the first existing  
26         railway track at the raised height.

27

28     34. A turnout according to claim 33, wherein the  
29     turnout further comprises another second portion  
30     which includes a further ramp member adapted to  
31     lower the train wheel to a lower height at a



1 location between the inside rails of the first and  
2 second railway tracks.

3

4 35. A turnout according to either of claims 33 or  
5 34, wherein at least a portion of the raised track  
6 surface is supported in the lateral and or vertical  
7 direction at a plurality of locations along its  
8 length by a support device.

9

10 36. A turnout according to claim 35, wherein the  
11 support device comprises a plurality of sleeper  
12 supports and more preferably comprises a plurality  
13 of pot sleeper arrangements.

14

15 37. A turnout according to any of claims 33 to 36,  
16 wherein the one or more turnouts are temporary  
17 turnouts non-intrusive turnouts.

18

19 38. A turnout for a railway track comprising a pair  
20 of spaced apart rails, the turnout comprising a  
21 raised track surface which is adapted to provide a  
22 path along which the wheels of a train can travel  
23 from one railway track to another, wherein the  
24 raised track surface comprises a ramp member to  
25 permit a wheel of a train to enter the raised track  
26 surface, the ramp member comprising:-

27 a fixing mechanism to releasably secure the  
28 ramp member to one of the spaced apart rails;

29 an upper ramp surface which in use provides a  
30 rail surface for a tread of the wheel to traverse;  
31 and

1           a lead-in portion which is arranged at one side  
2   of the said one of the spaced apart rails, wherein  
3   the lead-in portion comprises an upper rail surface  
4   which, in use, is inclined at an angle to the  
5   horizontal axis and which provides a rail surface  
6   for a portion of the tread to traverse.

7  
8   39. A turnout according to claim 38, wherein the  
9   upper rail surface of the lead-in portion is  
10  arranged to lie at one side of the said one of the  
11  spaced apart rails and has an outermost end which is  
12  arranged to be located at a height lower than the  
13  upper rail surface of the said one of the spaced  
14  apart rails and an innermost end which merges into  
15  the rest of the upper rail surface of the ramp  
16  member.

17  
18  40. A turnout according to either of claims 38 or  
19  39, wherein the portion of the ramp member which  
20  merges from the lead-in portion to the rest of the  
21  upper rail surface is also arranged at an angle  
22  between the transverse direction of the rail surface  
23  and the longitudinal axis of the rail surface.

24  
25  41. A method of transferring a train from one  
26  railway track comprising a pair of spaced apart  
27  rails to a second railway track comprising a pair of  
28  spaced apart rails, the method comprising the steps  
29  of:-

30           providing a raised track surface having a first  
31  portion which comprises a raised portion and a  
32  second portion which comprises a lower portion

1 provided at a location between the spaced apart  
2 rails of the railway track, where the raised track  
3 surface is adapted to provide a path along which the  
4 wheels of the train can travel from the first to the  
5 second railway track;

6 driving the train along the first track and  
7 onto the raised track surface, wherein the first  
8 raised portion of is of a sufficient height such  
9 that the wheels of the train are arranged to clear  
10 the pair of spaced apart rails of the railway track;  
11 and  
12 continuing to drive the train onto the second lower  
13 portion of the raised track surface.

14

15 42. Apparatus for facilitating Single Line Working  
16 on a second railway track to clear a first railway  
17 track for maintenance or other purposes, the  
18 apparatus comprising a first non-intrusive crossover  
19 and a second non-intrusive crossover being spaced  
20 apart from the first non-intrusive crossover in the  
21 direction of the longitudinal axis of the pair of  
22 railway tracks, and which provide an undulating path  
23 along which wheels of a train can travel from the  
24 first to the second railway track and from the  
25 second to the first railway track characterised in  
26 that the non-intrusive crossovers comprise removable  
27 portions and fixed portions and the undulating path  
28 is adapted such that said fixed portions do not  
29 project above a specified vertical height above the  
30 first or second railway tracks.